

PATENT ABSTRACTS OF JAPAN

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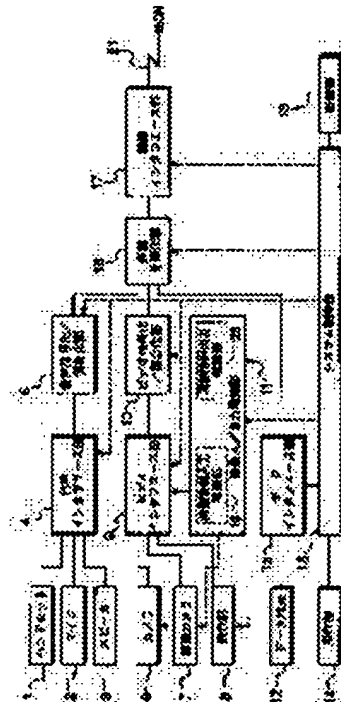
(54) MULTIMEDIA COMMUNICATION EQUIPMENT

(57)Abstract:

PURPOSE: To prevent wasteful power consumption and to protect the burning of a monitor screen by setting a picture input output power supply section automatically only when picture information communication is discriminated and resetting the power supply section when the end of communication is detected.

CONSTITUTION: When it is possible that a call is a call attended with picture communication as a terminal equipment after the arrival of a call, a frame synchronization establishment and capability information exchange sequence by a BAS(bit rate allocation signal) is tried. Based on the result, whether or not opposite communication for a video telephone/conference or the like attended with picture information is available is

discriminated. When the possession of picture communication capability is discriminated, a picture input output power supply 11 is automatically set to activate a camera 6 and a display section 8. When the end of the communication call is detected, the picture input output power supply section 11 is reset to stop the camera 6 and the display section 8. On the other hand, in the case of a call from a non-picture communication system or it is discriminated that the communication is not provided with picture communication capability, the processing is proceeded without special control of the picture input output power supply section 11.



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CLAIMS

[Claim(s)]

[Claim 1] The image information input section, the image information output section, the speech information input section, the speech information output section, It has the image input-and-output power supply section which supplies electric power to the circuit interface section, the above-mentioned image information input section, and the image information output section, respectively, and a communication line is minded. The means of communications in which two-way communication is possible as telephone equipment, In the multimedia communication equipment which multiplexes multimedia information, such as speech information, image information, and data, and has the means of communications in which two-way communication is possible A 1st detection means to detect whether the arrival detected from the above-mentioned circuit interface section is the arrival of the multimedia two-way communication accompanied by an image information communication link, An initiation means of operation to start the above-mentioned power supply section and to start actuation of the above-mentioned image information input section and the image information output section when the arrival of the multimedia two-way communication accompanied by an image information communication link in the above-mentioned arrival is detected by this 1st detection means, A 2nd detection means to detect that the above-mentioned multimedia two-way communication was completed, Multimedia communication equipment characterized by providing the means for stopping of operation which stops electric supply of the above-mentioned power supply section, and suspends actuation of the above-mentioned image information input section and the image information output section when termination of the above-mentioned multimedia two-way communication is detected by this 2nd detection means.

[Claim 2] A deactivation means to suspend electric supply starting of the above-mentioned power supply section when the above-mentioned 1st detection means detects the arrival of the above-mentioned multimedia two-way communication, A 3rd detection means to detect that the image information communication link was actually started, Multimedia communication equipment according to claim 1 characterized by providing a 2nd actuation initiation means to carry out electric supply starting of the above-mentioned power supply section, and to start actuation of the above-mentioned image information input section and the image information output section when initiation of the above-mentioned image information communication link is detected by this 3rd detection means.

[Claim 3] Multimedia communication equipment according to claim 2 carry out having provided a 3rd actuation initiation means to have carried out electric supply starting in the power supply section of the above-mentioned image information output section, and to start actuation of the above-mentioned image information output section when electric supply starting of the power supply section of the above-mentioned image information input section is carried out when image information transmission is started, actuation of the above-mentioned image information input section is started and image information reception is started as the description.

[Claim 4] A 4th actuation initiation means to carry out electric supply starting of the power supply section of the above-mentioned image information output section also at the time of the arrival of

telephone communication without the above-mentioned image information communication link etc., and to start actuation of the above-mentioned image information output section, A display means to display the message at the time of arrival of the mail on the above-mentioned image information output section, Multimedia communication equipment according to claim 1 characterized by providing the 2nd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image output section, and suspends actuation of the above-mentioned image information output section by answering to the above-mentioned arrival.

[Claim 5] The 3rd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image information output section automatically after fixed time amount progress, and suspends actuation of the above-mentioned image information output section after displaying the message at the time of the arrival of telephone communication without the above-mentioned image information communication link etc. on the above-mentioned image information output section, A directions means to direct the message indicator from a control unit, and a 4th detection means to detect directions by this directions means, Multimedia communication equipment according to claim 4 characterized by providing a 2nd display means to carry out electric supply starting of the power supply section of the above-mentioned image information output section based on directions by the above-mentioned directions means, and to display the above-mentioned message on the above-mentioned image information output section.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the multimedia communication equipment which makes representation AV (Audio Visual) communication devices, such as TV phone equipment, a video conference system, etc. which can multiplex and carry out two-way communication of the multimedia information, such as speech information, image information, and data.

[0002]

[Description of the Prior Art] In recent years, utilization of the communication service by the ISDN (integrated services digital network) circuit is started, and AV service of the TV phone equipment, the video conference system, etc. using such a digital channel attracts attention. The coding method of the service convention for AV service, protocol specification, the multimedia multiplexing frame structure, and dynamic-image information etc. is specified as H. H. H. CCITT (Consulting Committee of International Telegraph & Telephone) advice "H.320", "242", "221", "230", "H.261", etc. The frame structure in AV service on a 64kbps - 1920kbps channel is prescribed by "H. 221."

[0003] Drawing 5 shows the frame structure of "221 [H.]" on one 64kbpsx, the figure of 1-80 of a bit number and an axis of ordinate is a octet number, and the figure of 1-8 of an axis of abscissa constitutes one frame from 80 octets. it can set to this drawing -- being FAS (frame alignment signal) -- frame synchronization and multi-framing synchronous control, the monitoring function of communication link quality, the notice of alarm information, etc. are controlled.

[0004] drawing 6 (a) -- the above -- it is drawing showing the bit assignment between FAS 1 multi-framing = 8 submulti-framing (1 submulti-framing = two frames). Moreover, BAS (bit rate allocation signal) performs assignment of the bit rate allocation for every Media in the capacity of a terminal, and an actual frame, and various kinds of control and notices in addition to this. As shown in drawing 6 (b), BAS is transmitted in even frames and a corresponding error correction bit is transmitted in an odd frame.

[0005] Communication procedures, such as a capacity information-interchange sequence mode change-over sequence which used BAS in the in channel between AV terminals, are prescribed by "H. 242." The system aspect of AV service at large is prescribed by "H.320." As additional information over a function required for AV service, "H. 230" has prescribed various kinds of control and notices which need transmission frame synchronization or an urgent response. Coding/decryption method of the dynamic-image information in the rate of px64kbps (p=1-30) is prescribed by "H.261."

[0006] According to the above-mentioned advice, the fundamental sequence at the time of performing multimedia communication, such as an image, voice, and data (all User Information other than an image and voice), is shown in drawing 7. Out channel call control is started and arrival of the mail is notified to other party equipment by starting [equipment / (henceforth start side equipment) / which wants to start a communication link first / multimedia communication]. In the case of an ISDN circuit, the call setup sequence by D channel (ch) is started.

[0007] In destination-side equipment, arrival of the mail judges first whether it is the call of a TV phone

at step 701. an ISDN circuit -- BC (transfer capacity) information element in the setup message on Dch call control, and an HLC (high order layer adjustment) information element and an LLC (lower order layer adjustment) information element -- a telephone call or a TV phone call -- or another call is completely judged.

[0008] When considered a TV phone call, it progresses to step 702 and a Dch call setup is performed. Subsequently, FAS retrieval, detection, and sending out and detection of A bit =0 perform frame synchronization establishment on the connection progressed and set as step 703 (in ISDN, it is equivalent to Bch, Hch, etc.). The capacity of partner equipment is judged at step 704 after this synchronous establishment by the capacity information-interchange sequence by capacity BAS transmission / reception detection. Subsequently, it opts for the multimedia multiplexing allocation on the 1st connection at step 705, the mode change-over sequence by BAS command transmission and reception is performed, and a multimedia multiplexing communication link is started.

[0009] In fact, in this case, when carrying out by continuing additional connection establishment, only a speech information communication link is performed in many cases. For example, a communication link is started in the mode of the voice 56 kbps-H261 image OFF. Then, it progresses to step 706, and when it is judged that there is additional connection capacity both self-equipment side and partner equipment sides, it progresses to step 707 and an additional connection is established. Then, after performing frame synchronization, multi-framing synchronization, and synchronous establishment processing with the 1st channel at step 708 using FAS retrieval and detection of an additional connection, and A bits, it judges whether it returns to said step 706 and there is any need for an additional connection further again.

[0010] If the need for an additional connection is lost, after determining the mode of operation which was suitable for all channel use at step 709, performing the mode change-over sequence by transmission and reception of the BAS command and performing multimedia multiplex communication, this processing actuation is ended. However, the mode change-over sequence by the BAS command performed at said step 709 may be immediately performed after activation of the synchronous establishment step 708 for every additional connection each time.

[0011] The fundamental sequence of destination-side equipment when the conventional TV phone is performing ON/OFF control of an image input-and-output power supply section to drawing 8 is shown. It waits until arrival-of-the-mail detection is first made at step 801. If arrival of the mail is detected, it will progress to step 802 and an image input-and-output power supply section will be turned ON. Next, in step 803, communication link termination is supervised at step 804, actually performing two-way communication of voice and image information. If starting of communication link termination is detected at this step 804, it will progress to step 805, an image input-and-output power supply section will be turned OFF, and this processing actuation will be ended.

[0012] Start side equipment turns ON an image input-and-output power supply section, when start actuation is started. Moreover, as control which turns OFF an image input-and-output power supply section, when there is no access in fixed time amount equipment after power-source ON in the state of un-communicating, there is also a thing which is performing the same control as usually being carried out to a computer terminal of turning OFF.

[0013]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, before judging that it is that for which arrival of the mail uses a TV phone call, i.e., the image information input-and-output section, the image input-and-output power supply section which needs a power supply most in the above-mentioned equipment is unconditionally kept as ON.

[0014] Therefore, when the image information input-and-output section did not need to be used like [when it is a telephone call as a result and is the arrival of the data transmission system of - and others], there was a fault that power will be consumed vainly.

[0015] Moreover, even when it was a TV phone call as a result, the phase which pictorial communication actually starts was after the negotiation procedure on an in channel etc., and it was useless to have turned ON the above-mentioned power supply section immediately after arrival of the mail.

[0016] Furthermore, it had meant that after communication link initiation had turned ON this power supply section in the former although there was no need that after communication link initiation keeps this power supply section carried out to ON although setting the above-mentioned power supply section to ON for the time being when making an image information output monitor serve a double purpose for information displays, such as a notice of the addresser by the ISDN circuit, and using had the meaning.

[0017] The place which this invention was made in view of the above-mentioned situation, and is made into the purpose prevents being turned on vainly, and an image input-and-output power supply section is to offer the multimedia communication equipment which aimed at reduction-izing of power consumption, and seizure protection of a monitoring screen.

[0018]

[Means for Solving the Problem] In order to attain the above-mentioned purpose the multimedia communication equipment of this invention The image information input section, the image information output section, the speech information input section, the speech information output section, It has the image input-and-output power supply section which supplies electric power to the circuit interface section, the above-mentioned image information input section, and the image information output section, respectively, and a communication line is minded. The means of communications in which two-way communication is possible as telephone equipment, In the multimedia communication equipment which multiplexes multimedia information, such as speech information, image information, and data, and has the means of communications in which two-way communication is possible A 1st detection means to detect whether the arrival detected from the above-mentioned circuit interface section is the arrival of the multimedia two-way communication accompanied by an image information communication link, An initiation means of operation to start the above-mentioned power supply section and to start actuation of the above-mentioned image information input section and the image information output section when the arrival of the multimedia two-way communication accompanied by an image information communication link in the above-mentioned arrival is detected by this 1st detection means, A 2nd detection means to detect that the above-mentioned multimedia two-way communication was completed, When termination of the above-mentioned multimedia two-way communication is detected by this 2nd detection means, it is characterized by providing the means for stopping of operation which stops electric supply of the above-mentioned power supply section, and suspends actuation of the above-mentioned image information input section and the image information output section.

[0019] Moreover, a deactivation means to suspend electric supply starting of the above-mentioned power supply section when attaining the same purpose, and the above-mentioned 1st detection means detects the arrival of the above-mentioned multimedia two-way communication, It is desirable in providing a 3rd detection means to detect that the image information communication link was actually started, and a 2nd actuation initiation means to carry out electric supply starting of the above-mentioned power supply section, and to start actuation of the above-mentioned image information input section and the image information output section when initiation of the above-mentioned image information communication link is detected by this 3rd detection means.

[0020] Moreover, when electric supply starting of the power supply section of the above-mentioned image information input section is similarly carried out when image information transmission is started, actuation of the above-mentioned image information input section is started and image information reception is started, it is desirable in providing a 3rd actuation initiation means to carry out electric supply starting in the power supply section of the above-mentioned image information output section, and to start actuation of the above-mentioned image information output section.

[0021] Moreover, a 4th actuation initiation means to carry out electric supply starting of the power supply section of the above-mentioned image information output section also at the time of the arrival of telephone communication without the above-mentioned image information communication link etc., and to start actuation of the above-mentioned image information output section similarly, It is desirable to provide a display means to display the message at the time of arrival of the mail on the above-mentioned image information output section, and the 2nd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image output section, and suspends

actuation of the above-mentioned image information output section by answering to the above-mentioned arrival.

[0022] Furthermore, the 3rd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image information output section automatically after fixed time amount progress, and similarly suspends actuation of the above-mentioned image information output section after displaying the message at the time of the arrival of telephone communication without the above-mentioned image information communication link etc. on the above-mentioned image information output section, A directions means to direct the message indicator from a control unit, and a 4th detection means to detect directions by this directions means, It is desirable to provide a 2nd display means to carry out electric supply starting of the power supply section of the above-mentioned image information output section based on directions by the above-mentioned directions means, and to display the above-mentioned message on the above-mentioned image information output section.

[0023]

[Function] The multimedia communication equipment of claim 1 becomes possible [preventing useless consumption of power] by arrival of the mail's judging whether it is a call accompanied by an image information communication link, turning ON an image input-and-output power supply section automatically, only when it judges that it is an image information communication link, and setting the above-mentioned power supply section to OFF automatically by communicative termination detection.

[0024] Moreover, even when it is able to be judged that the multimedia communication equipment of claim 2 is an incoming call accompanied by an image information communication link, when pictorial communication is actually started, much more power-saving becomes realizable by setting the above-mentioned power supply section to ON, without setting an image input-and-output power supply section to ON immediately.

[0025] Moreover, the multimedia communication equipment of claim 3 can support power consumption reduction further in consideration of the asymmetry in transmission and reception of an image information communication link by enabling directions of ON-OFF of the power supply section of the image information output sections, such as a monitor, and the image information input sections, such as a camera, separately.

[0026] Moreover, when taking a configuration which makes serve a double purpose and uses the image information output section as a means of an arrival-of-the-mail information display also to an incoming call which is not accompanied by image information communication link, at the time of arrival of the mail, the multimedia communication equipment of claim 4 sets the power supply section of the image information output section to ON, performs an arrival-of-the-mail information display, and stimulates the response to a user's arrival. And when the return of the response to arrival of the mail is carried out by user actuation etc., while sharing a display and being able to perform presenting of the information required by the way which is the need by setting the above-mentioned power supply section to OFF, useless consumption of power is reducible.

[0027] Furthermore, by indicating the arrival-of-the-mail information display at the time of the communication link call of the above-mentioned non-image information system by fixed time amount by the internal timer, and setting the above-mentioned power supply section to ON based on directions of using the image information output section by actuation of a user also at the time of a non-image information system communication link, the multimedia communication equipment of claim 5 can use a display means resource effectively, though power consumption reduction is realized.

[0028]

[Example] Hereafter, the example of this invention is explained based on drawing 1 - drawing 6.

[0029] The [1st example] Drawing 1 is the block block diagram of the multimedia communication equipment concerning the 1st example of this invention. The hand set ~~whose~~ 1 is one of the voice input-and-output means in this drawing, the microphone whose 2 is one of the voice input means, the loudspeaker whose 3 is one of the voice output means, and 4 are the voice interface (I/F) sections. The function which switches the hand set 1 as a voice input-and-output means, a microphone 2, and a loudspeaker 3 with the directions of the system control section 15 mentioned later, ON / off-hook

detection function to detect in any a hand set 1 shall be between a condition on hook or an off-hook condition, When a microphone 2 and a loudspeaker 3 are used as a voice input-and-output means, it has tone generation functions, such as an echo cancellation function for eliminating an echo, a dial tone, ringing tone, a busy tone, and a ringer tone.

[0030] the directions of the system control section 15 which 5 is voice coding / decryption section, and are mentioned later -- 64kbps PCM (A-law) and 64kbps PCM (micro-law), and 64kbps/56kbps/48kbps the function which carries out D/A conversion of the function which carries out A/D conversion of the transmitting sound signal, and is encoded according to sound signal coding / decryption algorithms, such as SB-ADPCM, 32kbpsADPCM, 16kbps, and 8kbps, and the receiving sound signal, and decrypts them -- **** -- it is.

[0031] The camera for 6 being one of the image input means, and inputting a self-portrait etc., 7 is one of the image input means, and the paintings-and-calligraphic-works camera for inputting a picture, a drawing, etc., the display as which 8 displays an input image, a receiving image from a partner, an actuation screen, etc. from a camera 6 or the paintings-and-calligraphic-works camera 7, and 9 are the video interface sections. It has a picture signal composition function for indicating the function which switches the camera 6 as an image input means, and the paintings-and-calligraphic-works camera 7, a display switch of an input image, a receiving image, and an actuation screen, and them by division on a display 8 with the directions of the system control section 15 mentioned later.

[0032] 10 is video coding / decryption section (image codec section), and has the function which carries out D/A conversion of the function which carries out A/D conversion of the transmitting picture signal, and is encoded according to CCITT advice [H.261], and the receiving video signal, and decrypts them. 11 is the display 8 which is six cameras, 7 paintings-and-calligraphic-works camera, and the image information output section which are an image input-and-output power supply section, and are the above-mentioned image information input section, and a thing which supplies and stops the power to the video interface section 9 and video coding / decryption section 10 further depending on the case.

[0033] The data terminal with which 12 transmits and receives data, and 13 are the data interface sections, and they notify received data to a data terminal 12 or the system control section 15 mentioned later while they notify a data terminal 12 and the transmit data from the system control section 15 to the demultiplexing-ized section 16.

[0034] Control units, such as a keyboard used in order that 14 may input the control information for performing control of this equipment at large, and 15 are the system control sections. It has CPU, ROM, RAM, an auxiliary storage unit, etc., and the condition of each part is supervised. Control of this whole equipment, The allocation transmission speed to each media is calculated according to input-control information, a use circuit condition, etc., and activation of application programs, such as final decision and control in the mode, ON/OFF control of the image input-and-output power supply section 11, and a man machine interface, etc. is performed.

[0035] 16 is the demultiplexing-ized section, divides a receiving frame into each media of a configuration unit, and notifies it to each part while it multiplexes control information, such as a sound signal from voice coding / decryption section 5, a picture signal from video coding / decryption section 10, data from the data interface section 12, data from the system control section 15, and CCITT advice "H. 221" - "H. 242", per transmitting frame according to CCITT advice "H. 221."

[0036] 17 is the circuit interface section which controls a circuit 21 according to an ISDN user and a network interface. 18 is the storage section which memorizes various control information. In addition, the image input-and-output power supply section 11 has the image information input power section 19 and the image information output power supply section 20. The image information input power section 19 performs the electric power supply to the image information input section of a camera 6 and paintings-and-calligraphic-works camera 7 grade. Moreover, the image information output power supply section 20 performs the electric power supply to the image information output section of display 8 grade.

[0037] Drawing 5 is drawing showing the frame structure in 64kbps channels shown by CCITT advice "H. 221", and 6 Figs. are drawing showing FAS within 1 multi-framing, and the bit sign of BAS.

[0038] Actuation of the multimedia communication equipment of the above-mentioned configuration is explained in full detail based on the flow chart of drawing 2 below.

[0039] It waits to detect arrival of the mail at step 201 first. If arrival-of-the-mail detection is made, it will progress to step 202 and an applicable incoming call will judge whether it is the incoming call of explicit non-pictorial communication systems, such as a telephone call. Specifically, in the case of an ISDN circuit, it judges by the check of the BC-HLC-LLC information element in the SETUP message which received by Dch call control etc.

[0040] After arrival of the mail, when it may be a call accompanied by pictorial communication as a H.320 terminal, the capacity information-interchange sequence by BAS is tried at H.221 frame-synchronization establishment and step 204 by step 203. Then, it progresses to step 205 and judges whether two-way communication, such as a TV phone/meeting accompanied by image information, is possible based on the result of having performed the above-mentioned step 203 and step 204. An H.221 synchronous frame is established, and when it is able to judge that it had H.261 pictorial communication capacity as a result of [both] the capacity information-interchange sequence by BAS with partner equipment, it progresses to the following step 206 and the image input-and-output power supply section 11 is specifically turned ON automatically, and a camera 6 and a display 8 are made into operating status.

[0041] Next, at step 208, after progressing to step 207 and actually performing multimedia two-way communication, such as voice and image information, it waits until it detects termination of an applicable communication link call. If communication link termination is detected at this step 208, the image input-and-output power supply section 11 will be turned OFF at step 209, and operation of a camera 6 and a display 8 will be stopped. When it is judged at the above-mentioned step 202 on the other hand that it is the incoming call of a non-pictorial communication system, and when it is judged at the above-mentioned step 205 that it is the communication link without pictorial communication capacity, this processing actuation is ended without controlling the image input-and-output power supply section 11 [especially], when a partner is 7kHz voice telephone equipment.

1 Voice
call

[0042] The [2nd example] Actuation of the multimedia communication equipment applied to the 2nd example of this invention next is explained in full detail based on the flow chart of drawing 3.

[0043] It supervises first whether there is any arrival of the mail at step 301. If arrival-of-the-mail detection is made, it will progress to step 302 and an applicable incoming call will judge whether it is the incoming call of explicit non-pictorial communication systems, such as a telephone call. In the case of an ISDN circuit, it judges like the 1st example mentioned above by the check of the BC-HLC-LLC information element in the SETUP message which received by Dch call control etc.

1 Phone
call

[0044] When there is possibility of the incoming call accompanied by pictorial communication, the capacity information-interchange sequence which used H.221 frame-synchronization establishment and BAS at step 303 is tried. Next, it progresses to step 304, and based on the result of having performed the above-mentioned step 303, it judges whether they are the TV phone/conference communications of the H.320 terminal accompanied by pictorial communication, and if that is right, it will progress to step 305. At this step 305, it progresses to step 306, after starting image information multiplexing to H. the "221BAS command image ON" and "H. 221" a top and starting image transmission at step 311, while turning ON the image information input power section 19 and starting a camera 6 if it judges whether the image transmission from the end side of a local was started and initiation of image transmission is detected.

[0045] Moreover, if initiation of image transmission is not detected at said step 305, it progresses to step 306. Detection of the image information reception initiation from partner equipment is performed by supervising an H221BAS command at this step 306, and it progresses to step 312 by BAS command reception of Image ON, and it progresses to step 307, after turning ON the image information output power supply section 20, starting a display 8 and displaying a receiving image.

[0046] Moreover, if initiation of image reception is not detected at said step 306, it progresses to step 307. It progresses to step 308, after progressing to step 313, turning OFF the image information input power section 19 and suspending actuation of a camera 6, supposing it supervises termination of image

transmission at this step 307 and the factor of image transmitting termination of the image transmission OFF by user actuation etc. is detected.

[0047] Moreover, at said step 307, if image reception termination is not detected, it progresses to step 308. It progresses to step 309, after progressing to step 314, turning OFF the image information output power supply section 20 and suspending actuation of a display 8, supposing it supervises the factor of image reception termination of a receiving BAS command etc. at this step 308 and is able to detect a factor.

[0048] Moreover, if image reception termination is not detected at the above-mentioned step 308, it progresses to step 309. At this step 309, it supervises whether the communication link was completed. And if a communication link is not completed and return and communication link termination are detected by the above-mentioned step 305, it will progress to step 310, and the image input-and-output power supply section 11 is turned OFF, and this processing actuation is ended.

[0049] Moreover, when it is judged at the above-mentioned step 304 that they are not a TV phone/conference communications when the incoming call of a non-pictorial communication system is detected at the above-mentioned step 302 and, this processing actuation is ended, without controlling each.

[0050] In addition, the image input-and-output power supply section 11 may be turned OFF after displaying fixed time amount and communication link termination information on a display 8, without turning off the image input-and-output power supply section 11 immediately at this time.

[0051] Moreover, although image information input / output power supply sections 19 and 20 were separately controlled by the 2nd example of the above, it may be made to carry out package control of these.

[0052] The [3rd example] Next, the 3rd example of this invention is explained in full detail based on the flow chart of drawing 4.

[0053] First, it supervises whether there is any arrival of the mail at step 401. If arrival-of-the-mail detection is made, it will progress to step 402, and the image information output power supply section 20 is turned ON, and a display 8 is made into operating state. Subsequently, after displaying arrival-of-the-mail information on a display 8 at step 403, the response to arrival of the mail is carried out what at step 404, or it waits for user actuation.

[0054] If an arrival-of-the-mail reception response is made at this step 404, it will progress to step S405, and an applicable call judges whether they are calls, such as a TV phone/meeting accompanied by an image information communication link. If it is non-pictorial communication system calls, such as a telephone call, after progressing to step 406 and starting Timer T, it waits for the above-mentioned timer T to pass the deadline of at step 407. And if Timer T passes the deadline of, it progresses to step 408, and it will progress to step 409, after turning OFF the image information output power supply section 20 and suspending actuation of a display 8.

[0055] At this step 409, it supervises whether the demand of message indicator ON was made by user actuation. When the demand of message indicator ON is made, after turning ON the image information output power supply section 20 at step 410, a message indicator is performed at step 411.

[0056] Subsequently, if the trigger of message indicator OFF is conversely supervised at step 412 and message indicator OFF is detected, at step 413, the image information output power supply section 20 will be turned OFF, and actuation of a display 8 will be suspended. Then, it supervises whether it progressed to step 414 and the communication link was completed, and if communication link termination is not detected, return and after [if detected] turning OFF the image input-and-output power supply section 11 at step 415, this processing actuation is ended to the above-mentioned step 409.

[0057] Moreover, when it is distinguished at the above-mentioned step 405 that they are a TV phone/conference communications, after progressing to step 416, turning ON the image information input power section 19 and making a camera 6 and a display 8 into operating status, it moves to the above-mentioned step 414.

[0058] Moreover, when demand actuation of message indicator ON is not made at the above-mentioned

step 409, it moves to the above-mentioned step 412.

[0059] Furthermore, when message indicator OFF is not detected at the above-mentioned step 412, it moves to the above-mentioned step 414.

[0060]

[Effect of the Invention] While being able to prevent useless consumption of power by setting an image input-and-output power supply section to OFF automatically by communication link termination detection again by setting an image input-and-output power supply section to ON according to the multimedia communication equipment of claim 1 of this invention, without turning ON an image input-and-output power supply section unconditionally at the time of arrival of the mail only when it is judged that it is a call accompanied by pictorial communication as explained above, protection of a monitor can also plan.

[0061] Moreover, according to the multimedia communication equipment of claim 2 of this invention, when an image input-and-output power supply section is not turned ON when it is judged that it is only a call accompanied by pictorial communication, but the directions from a high order or the notice from partner equipment is supervised and pictorial communication is actually started, reduction of power consumption can be further aimed at by setting the above-mentioned power supply section to ON.

[0062] Moreover, according to the multimedia communication equipment of claim 4 of this invention, reduction of more effective power consumption can be aimed at by ON-OFF [only the image information input power section, and / only an image information output power supply section] at the time of image reception initiation and a halt in consideration of the asymmetry of the communicate mode at the time of two-way communication. [at the time of image transmitting initiation and a halt]

[0063] Furthermore, according to the multimedia communication equipment of claim 5, it sets at the time of - call-in reception actuation etc. at the time of call origination actuation also at the time of a call without pictorial communication. Only when it judges that it is better to use an actuation top display, in order to use it as a display of man-machine control of the image output section temporarily If an image information output power supply section is set to ON and need is lost, it will become possible also about effective use of a resource with reduction of power consumption by setting an image information output power supply section to OFF automatically.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the multimedia communication equipment which makes representation AV (Audio Visual) communication devices, such as TV phone equipment, a video conference system, etc. which can multiplex and carry out two-way communication of the multimedia information, such as speech information, image information, and data.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] In recent years, utilization of the communication service by the ISDN (integrated services digital network) circuit is started, and AV service of the TV phone equipment, the video conference system, etc. using such a digital channel attracts attention. The coding method of the service convention for AV service, protocol specification, the multimedia multiplexing frame structure, and dynamic-image information etc. is specified as H. H. H. CCITT (Consulting Committee of International Telegraph & Telephone) advice "H.320", "242", "221", "230", "H.261", etc. The frame structure in AV service on a 64kbps - 1920kbps channel is prescribed by "H. 221."

[0003] Drawing 5 shows the frame structure of "221 [H.]" on one 64kbpsx, the figure of 1-80 of a bit number and an axis of ordinate is a octet number, and the figure of 1-8 of an axis of abscissa constitutes one frame from 80 octets. it can set to this drawing -- being FAS (frame alignment signal) -- frame synchronization and multi-framing synchronous control, the monitoring function of communication link quality, the notice of alarm information, etc. are controlled.

[0004] drawing 6 (a) -- the above -- it is drawing showing the bit assignment between FAS 1 multi-framing =8 submulti-framing (1 submulti-framing = two frames). Moreover, BAS (bit rate allocation signal) performs assignment of the bit rate allocation for every Media in the capacity of a terminal, and an actual frame, and various kinds of control and notices in addition to this. As shown in drawing 6 (b), BAS is transmitted in even frames and a corresponding error correction bit is transmitted in an odd frame.

[0005] Communication procedures, such as a capacity information-interchange sequence mode change-over sequence which used BAS in the in channel between AV terminals, are prescribed by "H. 242." The system aspect of AV service at large is prescribed by "H.320." As additional information over a function required for AV service, "H. 230" has prescribed various kinds of control and notices which need transmission frame synchronization or an urgent response. Coding/decryption method of the dynamic-image information in the rate of px64kbps (p=1-30) is prescribed by "H.261."

[0006] According to the above-mentioned advice, the fundamental sequence at the time of performing multimedia communication, such as an image, voice, and data (all User Information other than an image and voice), is shown in drawing 7 . Out channel call control is started and arrival of the mail is notified to other party equipment by starting [equipment / (henceforth start side equipment) / which wants to start a communication link first / multimedia communication]. In the case of an ISDN circuit, the call setup sequence by D channel (ch) is started.

[0007] In destination-side equipment, arrival of the mail judges first whether it is the call of a TV phone at step 701. an ISDN circuit -- BC (transfer capacity) information element in the setup message on Dch call control, and an HLC (high order layer adjustment) information element and an LLC (lower order layer adjustment) information element -- a telephone call or a TV phone call -- or another call is completely judged.

[0008] When considered a TV phone call, it progresses to step 702 and a Dch call setup is performed. Subsequently, FAS retrieval, detection, and sending out and detection of A bit =0 perform frame synchronization establishment on the connection progressed and set as step 703 (in ISDN, it is

equivalent to Bch, Hch, etc.). The capacity of partner equipment is judged at step 704 after this synchronous establishment by the capacity information-interchange sequence by capacity BAS transmission / reception detection. Subsequently, it opts for the multimedia multiplexing allocation on the 1st connection at step 705, the mode change-over sequence by BAS command transmission and reception is performed, and a multimedia multiplexing communication link is started.

[0009] In fact, in this case, when carrying out by continuing additional connection establishment, only a speech information communication link is performed in many cases. For example, a communication link is started in the mode of the voice 56 kbps-H261 image OFF. Then, it progresses to step 706, and when it is judged that there is additional connection capacity both self-equipment side and partner equipment sides, it progresses to step 707 and an additional connection is established. Then, after performing frame synchronization, multi-framing synchronization, and synchronous establishment processing with the 1st channel at step 708 using FAS retrieval and detection of an additional connection, and A bits, it judges whether it returns to said step 706 and there is any need for an additional connection further again.

[0010] If the need for an additional connection is lost, after determining the mode of operation which was suitable for all channel use at step 709, performing the mode change-over sequence by transmission and reception of the BAS command and performing multimedia multiplex communication, this processing actuation is ended. However, the mode change-over sequence by the BAS command performed at said step 709 may be immediately performed after activation of the synchronous establishment step 708 for every additional connection each time.

[0011] The fundamental sequence of destination-side equipment when the conventional TV phone is performing ON/OFF control of an image input-and-output power supply section to drawing 8 is shown. It waits until arrival-of-the-mail detection is first made at step 801. If arrival of the mail is detected, it will progress to step 802 and an image input-and-output power supply section will be turned ON. Next, in step 803, communication link termination is supervised at step 804, actually performing two-way communication of voice and image information. If starting of communication link termination is detected at this step 804, it will progress to step 805, an image input-and-output power supply section will be turned OFF, and this processing actuation will be ended.

[0012] Start side equipment turns ON an image input-and-output power supply section, when start actuation is started. Moreover, as control which turns OFF an image input-and-output power supply section, when there is no access in fixed time amount equipment after power-source ON in the state of un-communicating, there is also a thing which is performing the same control as usually being carried out to a computer terminal of turning OFF.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] While being able to prevent useless consumption of power by setting an image input-and-output power supply section to OFF automatically by communication link termination detection again by setting an image input-and-output power supply section to ON according to the multimedia communication equipment of claim 1 of this invention, without turning ON an image input-and-output power supply section unconditionally at the time of arrival of the mail only when it is judged that it is a call accompanied by pictorial communication as explained above, protection of a monitor can also plan.

[0061] Moreover, according to the multimedia communication equipment of claim 2 of this invention, when an image input-and-output power supply section is not turned ON when it is judged that it is only a call accompanied by pictorial communication, but the directions from a high order or the notice from partner equipment is supervised and pictorial communication is actually started, reduction of power consumption can be further aimed at by setting the above-mentioned power supply section to ON.

[0062] Moreover, according to the multimedia communication equipment of claim 4 of this invention, reduction of more effective power consumption can be aimed at by ON-OFF [only the image information input power section, and / only an image information output power supply section] at the time of image reception initiation and a halt in consideration of the asymmetry of the communicate mode at the time of two-way communication. [at the time of image transmitting initiation and a halt]

[0063] Furthermore, according to the multimedia communication equipment of claim 5, it sets at the time of - call-in reception actuation etc. at the time of call origination actuation also at the time of a call without pictorial communication. Only when it judges that it is better to use an actuation top display, in order to use it as a display of man-machine control of the image output section temporarily If an image information output power supply section is set to ON and need is lost, it will become possible also about effective use of a resource with reduction of power consumption by setting an image information output power supply section to OFF automatically.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, before judging that it is that for which arrival of the mail uses a TV phone call, i.e., the image information input-and-output section, the image input-and-output power supply section which needs a power supply most in the above-mentioned equipment is unconditionally kept as ON.

[0014] Therefore, when the image information input-and-output section did not need to be used like [when it is a telephone call as a result and is the arrival of the data transmission system of - and others], there was a fault that power will be consumed vainly.

[0015] Moreover, even when it was a TV phone call as a result, the phase which pictorial communication actually starts was after the negotiation procedure on an in channel etc., and it was useless to have turned ON the above-mentioned power supply section immediately after arrival of the mail.

[0016] Furthermore, it had meant that after communication link initiation had turned ON this power supply section in the former although there was no need that after communication link initiation keeps this power supply section carried out to ON although setting the above-mentioned power supply section to ON for the time being when making an image information output monitor serve a double purpose for information displays, such as a notice of the addresser by the ISDN circuit, and using had the meaning.

[0017] The place which this invention was made in view of the above-mentioned situation, and is made into the purpose prevents being turned on vainly, and an image input-and-output power supply section is to offer the multimedia communication equipment which aimed at reduction-izing of power consumption, and seizure protection of a monitoring screen.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose the multimedia communication equipment of this invention The image information input section, the image information output section, the speech information input section, the speech information output section, It has the image input-and-output power supply section which supplies electric power to the circuit interface section, the above-mentioned image information input section, and the image information output section, respectively, and a communication line is minded. The means of communications in which two-way communication is possible as telephone equipment, In the multimedia communication equipment which multiplexes multimedia information, such as speech information, image information, and data, and has the means of communications in which two-way communication is possible A 1st detection means to detect whether the arrival detected from the above-mentioned circuit interface section is the arrival of the multimedia two-way communication accompanied by an image information communication link, An initiation means of operation to start the above-mentioned power supply section and to start actuation of the above-mentioned image information input section and the image information output section when the arrival of the multimedia two-way communication accompanied by an image information communication link in the above-mentioned arrival is detected by this 1st detection means, A 2nd detection means to detect that the above-mentioned multimedia two-way communication was completed, When termination of the above-mentioned multimedia two-way communication is detected by this 2nd detection means, it is characterized by providing the means for stopping of operation which stops electric supply of the above-mentioned power supply section, and suspends actuation of the above-mentioned image information input section and the image information output section.

[0019] Moreover, a deactivation means to suspend electric supply starting of the above-mentioned power supply section when attaining the same purpose, and the above-mentioned 1st detection means detects the arrival of the above-mentioned multimedia two-way communication, It is desirable in providing a 3rd detection means to detect that the image information communication link was actually started, and a 2nd actuation initiation means to carry out electric supply starting of the above-mentioned power supply section, and to start actuation of the above-mentioned image information input section and the image information output section when initiation of the above-mentioned image information communication link is detected by this 3rd detection means.

[0020] Moreover, when electric supply starting of the power supply section of the above-mentioned image information input section is similarly carried out when image information transmission is started, actuation of the above-mentioned image information input section is started and image information reception is started, it is desirable in providing a 3rd actuation initiation means to carry out electric supply starting in the power supply section of the above-mentioned image information output section, and to start actuation of the above-mentioned image information output section.

[0021] Moreover, a 4th actuation initiation means to carry out electric supply starting of the power supply section of the above-mentioned image information output section also at the time of the arrival of telephone communication without the above-mentioned image information communication link etc., and to start actuation of the above-mentioned image information output section similarly, It is desirable to

provide a display means to display the message at the time of arrival of the mail on the above-mentioned image information output section, and the 2nd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image output section, and suspends actuation of the above-mentioned image information output section by answering to the above-mentioned arrival.

[0022] Furthermore, the 3rd actuation means for stopping which carries out an electric supply halt of the power supply section of the above-mentioned image information output section automatically after fixed time amount progress, and similarly suspends actuation of the above-mentioned image information output section after displaying the message at the time of the arrival of telephone communication without the above-mentioned image information communication link etc. on the above-mentioned image information output section, A directions means to direct the message indicator from a control unit, and a 4th detection means to detect directions by this directions means, It is desirable to provide a 2nd display means to carry out electric supply starting of the power supply section of the above-mentioned image information output section based on directions by the above-mentioned directions means, and to display the above-mentioned message on the above-mentioned image information output section.

[Translation done.]

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OPERATION

[Function] The multimedia communication equipment of claim 1 becomes possible [preventing useless consumption of power] by arrival of the mail's judging whether it is a call accompanied by an image information communication link, turning ON an image input-and-output power supply section automatically, only when it judges that it is an image information communication link, and setting the above-mentioned power supply section to OFF automatically by communicative termination detection. [0024] Moreover, even when it is able to be judged that the multimedia communication equipment of claim 2 is an incoming call accompanied by an image information communication link, when pictorial communication is actually started, much more power-saving becomes realizable by setting the above-mentioned power supply section to ON, without setting an image input-and-output power supply section to ON immediately.

[0025] Moreover, the multimedia communication equipment of claim 3 can support power consumption reduction further in consideration of the asymmetry in transmission and reception of an image information communication link by enabling directions of ON-OFF of the power supply section of the image information output sections, such as a monitor, and the image information input sections, such as a camera, separately.

[0026] Moreover, when taking a configuration which makes serve a double purpose and uses the image information output section as a means of an arrival-of-the-mail information display also to an incoming call which is not accompanied by image information communication link, at the time of arrival of the mail, the multimedia communication equipment of claim 4 sets the power supply section of the image information output section to ON, performs an arrival-of-the-mail information display, and stimulates the response to a user's arrival. And when the return of the response to arrival of the mail is carried out by user actuation etc., while sharing a display and being able to perform presenting of the information required by the way which is the need by setting the above-mentioned power supply section to OFF, useless consumption of power is reducible.

[0027] Furthermore, by indicating the arrival-of-the-mail information display at the time of the communication link call of the above-mentioned non-image information system by fixed time amount by the internal timer, and setting the above-mentioned power supply section to ON based on directions of using the image information output section by actuation of a user also at the time of a non-image information system communication link, the multimedia communication equipment of claim 5 can use a display means resource effectively, though power consumption reduction is realized.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block block diagram of the multimedia communication equipment concerning the 1st example of this invention.

[Drawing 2] It is a flow chart for explaining actuation of this equipment.

[Drawing 3] It is a flow chart for explaining actuation of the multimedia communication equipment concerning the 2nd example of this invention.

[Drawing 4] It is a flow chart for explaining actuation of the multimedia communication equipment concerning the 3rd example of this invention.

[Drawing 5] It is the frame structure Fig. shown in CCITT advice "H. 221."

[Drawing 6] It is a bit allocation Fig. within multi-framing of FAS and BAS which are shown in CCITT advice "H. 221."

[Drawing 7] It is the flow chart which shows the fundamental sequence at the time of performing multimedia communication in conventional multimedia communication equipment.

[Drawing 8] It is the flow chart which shows the fundamental sequence of the destination-side equipment at the time of the ON/OFF control of an image input-and-output power supply section in this equipment.

[Description of Notations]

1 Hand Set (Speech Information Input-and-Output Section)

2 Microphone (Speech Information Output Section)

3 Loudspeaker (Speech Information Output Section)

4 Voice Interface Section

5 Voice Coding / Decryption Section

6 Camera (Image Information Input Section)

7 Paintings-and-Calligraphic-Works Camera (Image Information Input Section)

8 Display (Image Information Output Section)

9 Video Interface Section

10 Video Coding / Decryption Section

11 Image Input-and-Output Power Supply Section

12 Data Terminal

13 Data Interface Section

14 Control Unit

15 System Control Section (the 1st - 4th Detection Means, the 1st - 4th Actuation Initiation Means, the 1st - 3rd Actuation Means for Stopping, Deactivation Means, Directions Means, 1st and 2nd Display Means)

16 Demultiplexing-ized Section

17 Circuit Interface Section

19 Image Information Input Power Section

20 Image Information Output Power Supply Section

[Translation done.]

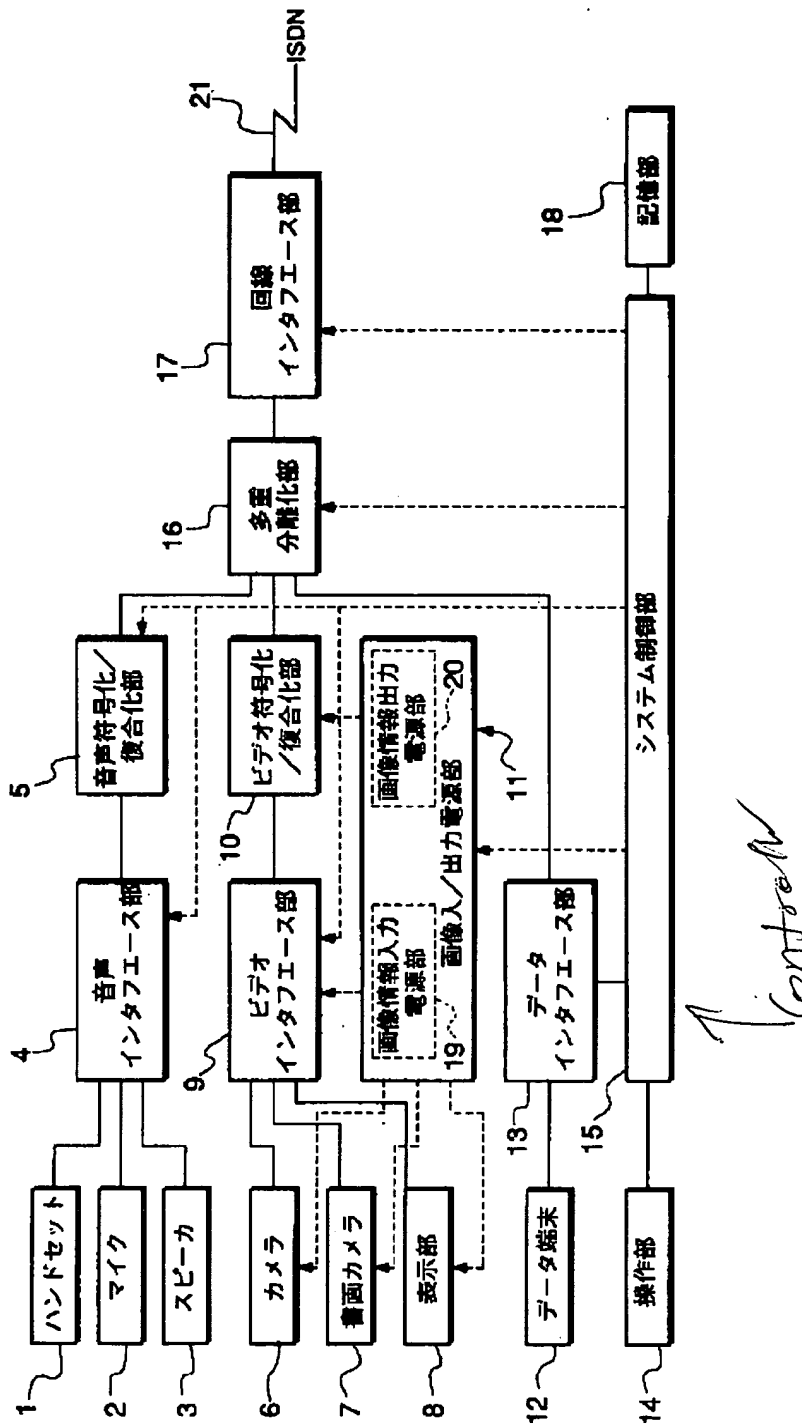
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DRAWINGS

[Drawing 1]



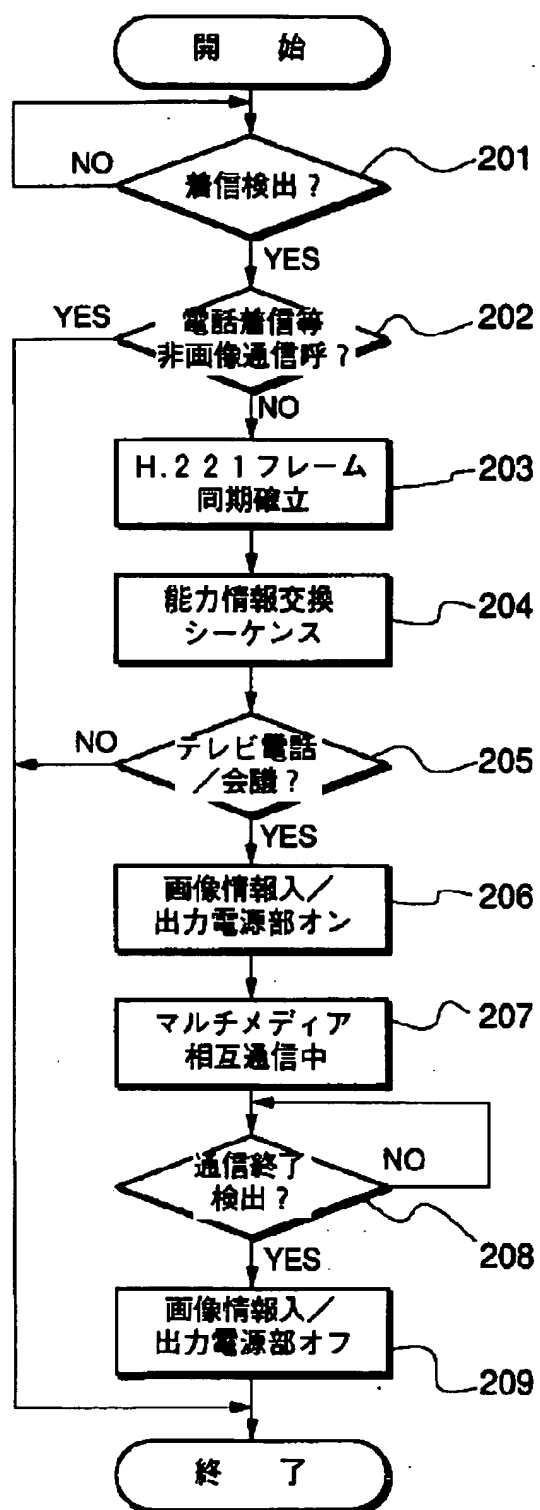
[Drawing 2]

6: Camera
7: painting and-calligraphy camera

8: display

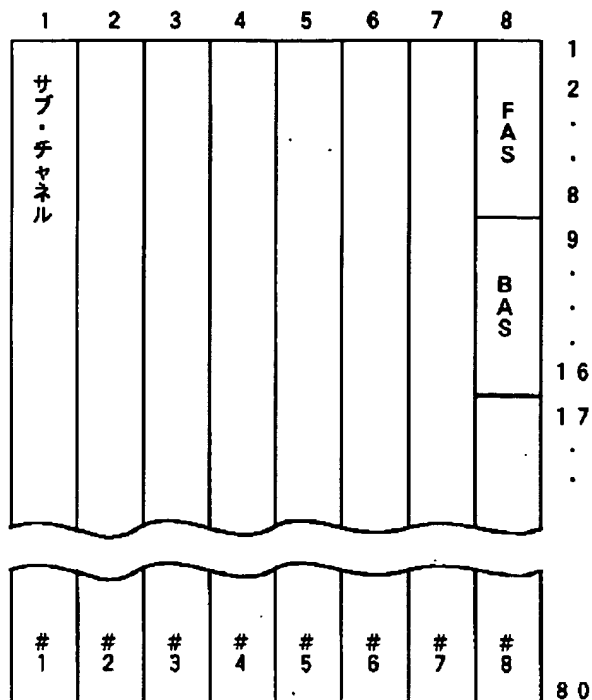
14: input control

18: storage



[Drawing 5]

ビット番号



[Drawing 6]

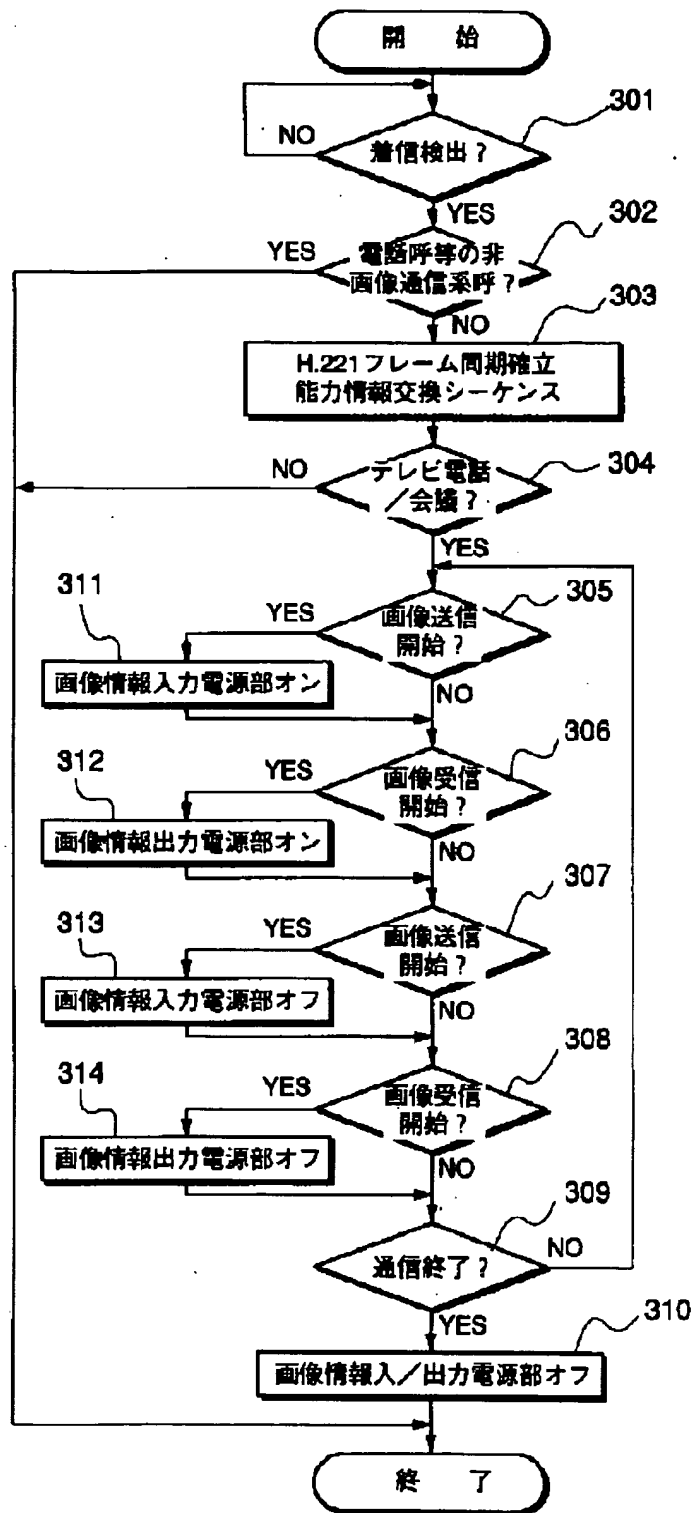
マルチフレーム

	サブ・チャンネル フレーム 番号	フレーム 番号	フレーム同期信号 (FAS)							
			b1	b2	b3	b4	b5	b6	b7	b8
(a)	SMF1	0	N1	0	0	1	1	0	1	1
		1	0	1	A	E	C1	C2	C3	C4
	SMF2	2	N2	0	0	1	1	0	1	1
		3	0	1	A	E	C1	C2	C3	C4
	SMF3	4	N3	0	0	1	1	0	1	1
		5	0	1	A	E	C1	C2	C3	C4
	SMF4	6	N4	0	0	1	1	0	1	1
		7	0	1	A	E	C1	C2	C3	C4
	SMF5	8	N5	0	0	1	1	0	1	1
		9	0	1	A	E	C1	C2	C3	C4
	SMF6	10	N6	0	0	1	1	0	1	1
		11	0	1	A	E	C1	C2	C3	C4
	SMF7	12	N7	0	0	1	1	0	1	1
		13	0	1	A	E	C1	C2	C3	C4
	SMF9	14	N8	0	0	1	1	0	1	1
		15	0	1	A	E	C1	C2	C3	C4

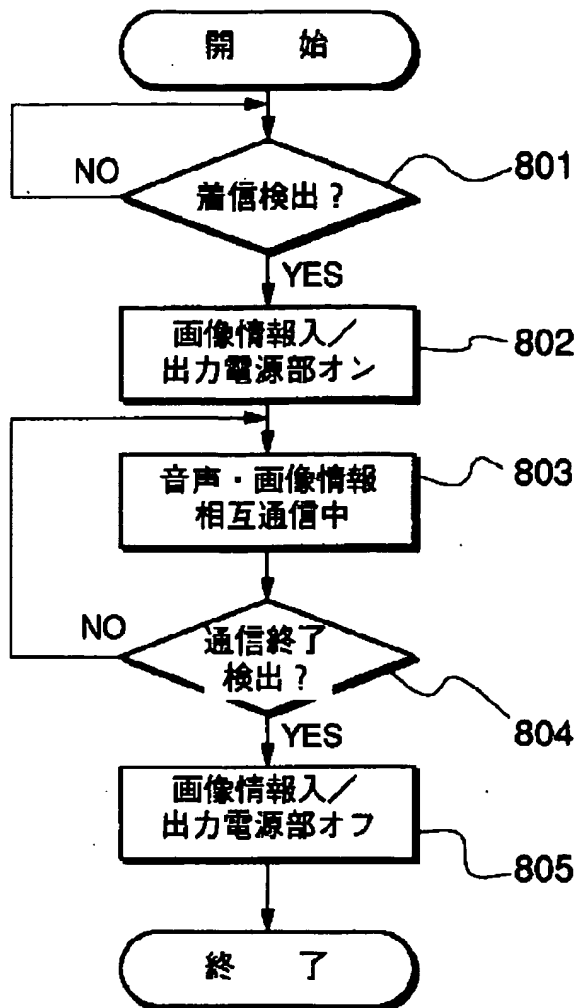
(b)

	ビット割り当て信号 (BAS)							
	b9	b10	b11	b12	b13	b14	b15	b16
偶数フレーム	B0	B1	B2	B3	B4	B5	B6	B7
奇数フレーム	P2	P1	P0	P4	P3	P5	P6	P7

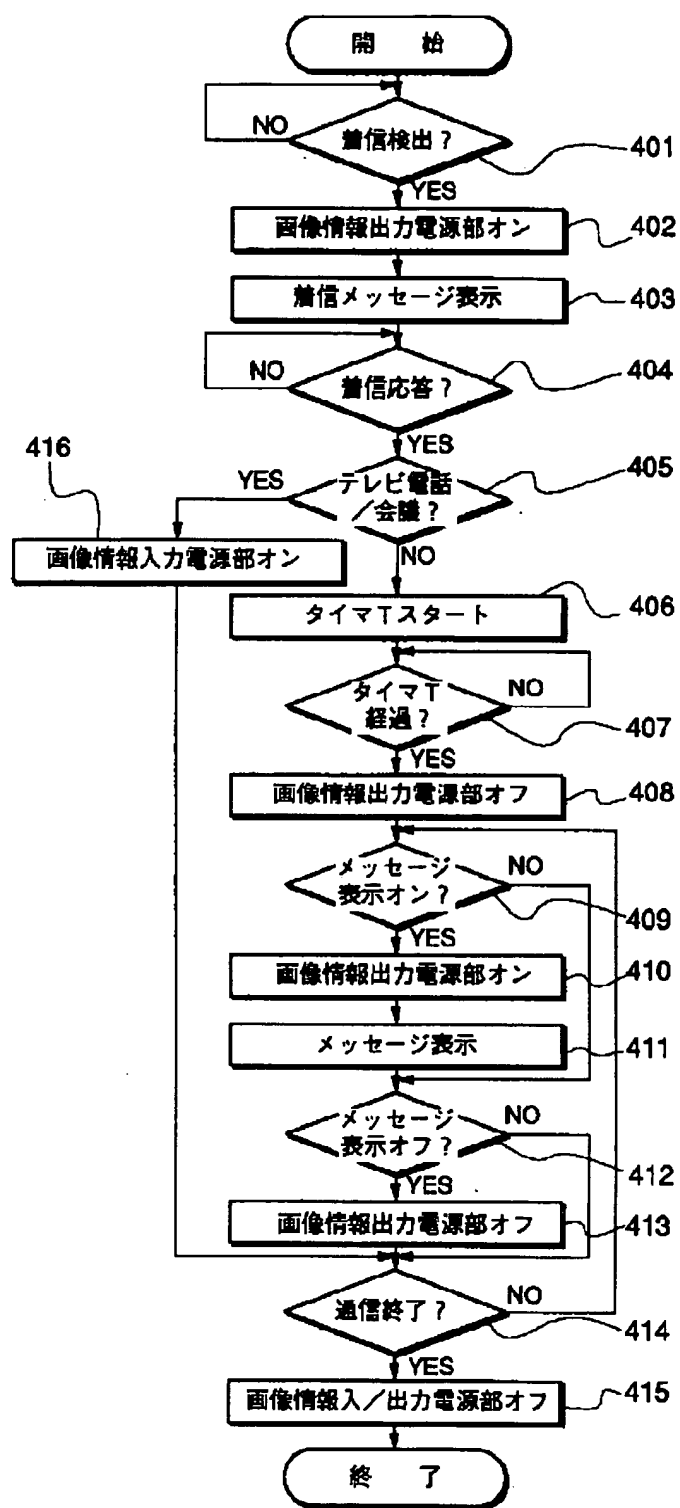
[Drawing 3]



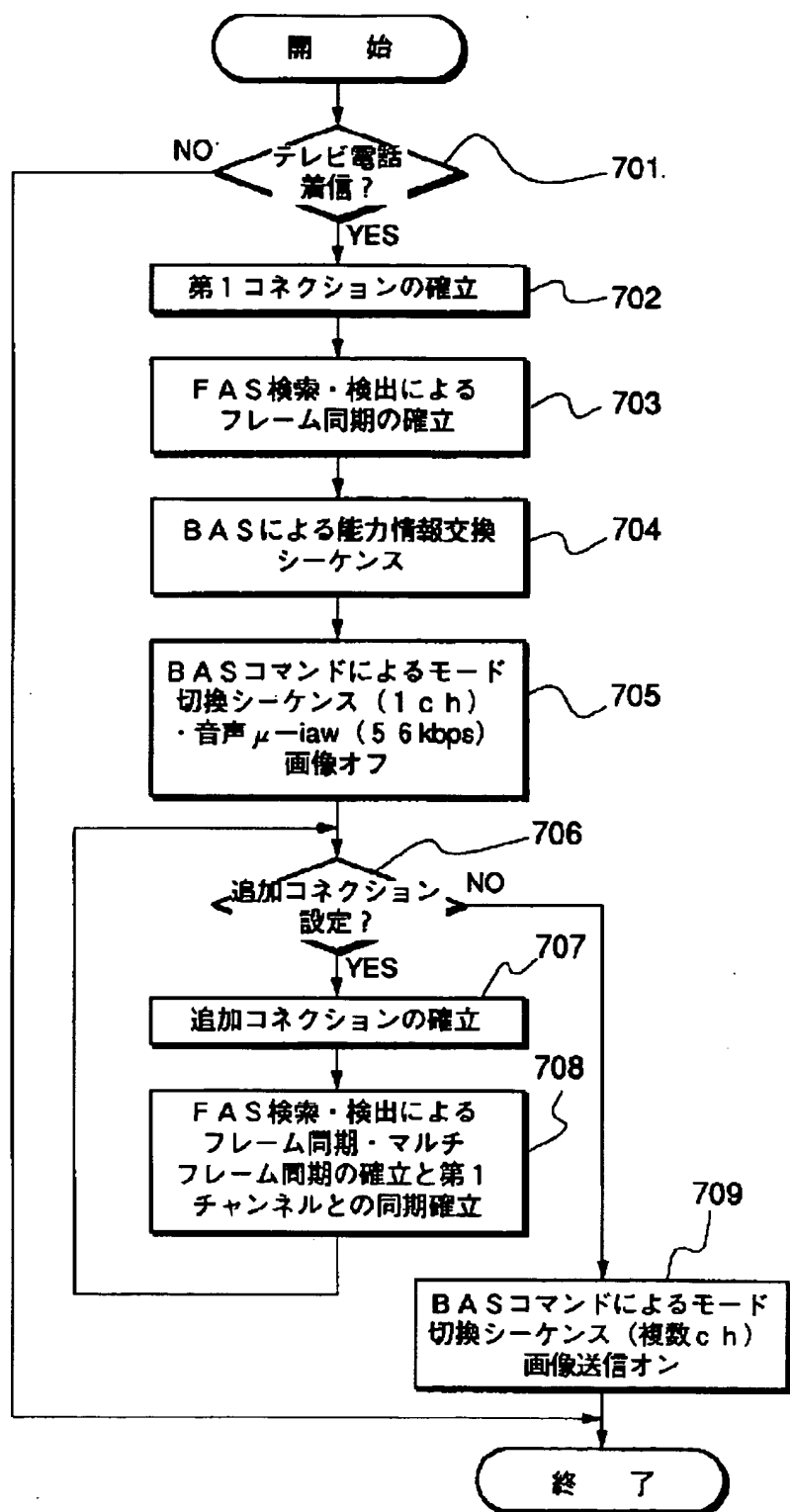
[Drawing 8]



[Drawing 4]



[Drawing 7]



[Translation done.]